A CONTRIBUTION

TO THE

DYNAMICS OF RACIAL DIET

IN

BRITISH INDIA,

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WITH THIS

I DESIRE TO ASSOCIATE THE NAME OF

MY FATHER,

TO WHOM I OWE SO MUCH.

INTRODUCTION.

THIS address was laid before the British Association (Physiological section) at Glasgow, on 11th September.

The subject excited considerable interest. I avail myself of this opportunity of thanking the President, members, and associates for their appreciation of it. I have been repeatedly urged to publish it. In doing so, I invite attention to the equations of the mechanical equivalents of energy, in the hope that some one enjoying the advantages of a residence *at home* may be led to investigate European dietaries on a similarly extended basis; and at the same time experimentally revise and improve our factors of energy, which, however useful as integers, have to me a slight cut of the algebraic × about them, and are far from being the product of an exact science.

In a very few days I leave for India. I cannot, therefore, as was suggested, contrast the value, character, and cost of European and Indian diets. I was, however, rather surprised to find educated men who really believed that the natives of India were generally vegetarians and Ethnic eaters of rice *per se*,—to realise that the theories and, in certain instances, the writings of others had determined what in their idea Indian diet should be, instead of what it is. At a future day I may compile a popular *précis* of the matter. Meanwhile, with these embalmed errors before me, allow me with the utmost humility to ask—Are these thy gods, O Israel! The prayer of Ajax—the inquiring public—is for light.

J. W. J.

KINNABER HOUSE, 21*st September* 1876.

Mr President,—Over fifteen years ago the late Professor Parkes of Netley suggested to me the advisability of investigating Indian racial diet as a collective study. Ever since I have endeavoured to acquaint myself with the dietetics and cuisine of the military, civil, and jail population in India; I am thus enabled to chart approximately, if not in every instance fiducially, the Ethnic diet of the Mahometans and Hindūs in British India, from Cashmere to Ceylon, from Burmah to Bombay.

I selected analyses of the food—Table I.—and determined the quantitative value of an avoirdupois ounce of each article, recording the albumenate, carbohydrate, hydrocarbon, salts of metals, and water. I also calculated out the carbon and nitrogen equivalent in each ounce.

From this analytical table I compiled the static value of 88 diets, many of which are in general use among the military, civil, and jail communities. A glance at Table IV. will give you an idea of their nature, as I cannot at present attempt to discuss them in detail, but at once proceed to the consideration of the diet of the native soldier in India.

The Sepoy is chiefly recruited from the Mahometans and Hindūs. The Mahometan is practically without caste, and is recognised, according to his provincial area, as a Hindustani or Panjabi and Pathan Mussulman; the Hindū castes are rigid and exclusive. Sinking minor classes they for our present purpose may be regarded as Purbeas (Hindustani Hindūs), Dogras (Hill Hindūs), and Sikhs (special Hindūs). I investigated fourteen separate diets of each of these classes, or 70 in all. The detail is shown in Table II. (only one is published as an illustration). From these caste diets, which represent a week's ration, I struck an average diet, and from each of these averages I formulated a representative racial dietary.

In Table III. I have recorded an analytic *résumé* of, and contrasted this with, Professor Parkes and Dr Edward Smith's proportional element requirements of the body, for Meleschott's standard adult male, 5 ft. 6–10 in. in height, and 140–160 lb in weight.

The dietaries of the Mahometan and Hindū closely approximate, because the Hindū occasionally indulges in food of increased nitrogenous value, and the Mahometan in one largely composed of non-nitrogens, so that by the week's end they are almost identical.

The salient features of the racial diet, when compared with Smith's element factors, are—

1. A deficiency in fatty properties by over one-fourth, and in the salts of metals by about one-half.

2. An increase in the diet equivalent of nitrogen by a shade more than two-thirds of an avoirdupois grain, and on the diet equivalent of carbon by 12·7 grains.

3. The proportion of warm spices is large.

4. The condimental salt utilised is one-third in excess.

5. There is in round numbers in the diet 360 grains of nitrogen and 7125 grains of carbon, being 69 grains of nitrogen and 1102 grains of carbon beyond European standard diet hard labour requirements.

I examined the urine of 120 prisoners fed on a measured diet, and the dejectæ of 20. The urine test afforded no special result, but the quantity of crude dietetic waste in the defecate was excessive. Pending further research, I have regarded the latter as equivalent in value to 12 lb of body weight in all my calculations,—the weight of the Sepoy being on an average struck from 712 men of all castes, 128 pounds against Meleschott's standard 140 pounds.

From a careful survey of the racial diet of the Sepoy I arrive at the following conclusions:—

1. He consumes more carbon and nitrogen in his daily *menu* than a European of equal weight and height.

2. The nutritive value of his diet is curtailed by a deficiency in fatty elements and the salts of metals, as well as by the crudity and inconcinite nature of the vegetable constituents,

which hurry on digestion, and, by acting as peristaltic persuaders, condition waste, a process ancillated and abetted by the preponderance of condimental salt.

3. Judging from the chemical value of the racial diet, it ought to ensure a magazine of potential energy, at least equivalent to that of any ordinary European diet consumed by the toiler of the sea or the tiller of the soil.

4. The reciprocal value of the native labourer's diet, which Table IV. shows to have much the same constitution as the caste diet of the Sepoy, is also equal to any ordinary European dietary. Lord Macaulay, therefore, in the introduction to his Classical History of England, arrives at a very incorrect conclusion about the food of the vast hordes that people India. His generalizations are only partially correct regarding the poor rice and fish feeders of Lower Bengal and its surroundings, *who are the few, not the many.*

5. The large excess of carbohydrates may shed a gleam of light upon the prevailing rheumatic constitution of the natives of India.

6. The small percentage of the salts of metals, together with the intermittent supply—a climatic result—of fruit and succulent vegetables, may account for the rapid progress made by the horrent limb ulcerations one encounters in Indian practice under purely antiscorbutic regimen.

7. Applying Ranke's value of hard labour, which is 626·7 foot tons to the representative racial diet, I find a muscular Sepoy can on his ordinary food, and fully accoutred with Snider arms, march 23·5 miles, which is a third at least more then he is usually called upon to do.

So much for the absolute and quantatitive constitution of the representative racial diet of the Sepoy.

From the static value I have endeavoured to estimate the kinetic equivalent energy of individual caste, and the representative racial dietaries. I may *en passant* note that the more fully one pursues the study of the philosophy of energy, the more thoroughly is he convinced that without the body of the fabled Momus to operate on, in which every recondite query regarding vitality was get-at-able by skilled armamen-

taria, the reciprocal mechanical units, or equivalents of food, by reason of chemical and physical change, as well as by the dissipation of force and other causes, can only be accepted as approximate, and by *no means* as absolute integers.

I, however, accepted the course detailed by Dr Lyon Playfair, in his "Food of Man in Relation to his Useful Work," in which he gives the chemical formulæ for dry albumenate, and explains the process of reducing this by calories into quantitative kenetic energy. Throughout these calculations of energy I have drawn upon the brilliant results of Professor Andrews of Belfast's (the President of the British Association for the year) careful and unwearied experiments; and it is by the application of his standard calories, or heat units, that the ultimate chemical elements are reduced into calorific equivalents. It being assumed that the same amount of heat originated by a given substance, burning rapidly in the circumambient air, will also be emitted by it when it is oxidised, reduced, or burned in the torrent of the circulation.

To enable me to frame a standard of reference, I collated the subjoined mechanical equivalents:—

	Foot lbs.
1. Ranke's: for respiration, digestion, and heart work, ...	1,036,490
2. As I could discover no allowance for the maintenance of the erect posture, I calculated it on Weber's formula, taking for convenience a man weighing 150 lb., and standing 5 feet high, . .	126,000
3. Ranke's: equivalent of hard labour, .	1,499,997
This is a total of	2,662,487
4. Since Heindenhain concludes that only one-half of the force of food is expressed as energy, I double this . . .	2
	5,324,974
Carry forward,	5,324,974

Brought forward,	5,324,974
5. Finally, I accepted Frankland's calculation, showing that only one-third of the dry albumen in any diet is consumed in the body (the remainder being secerned as urea), and added the value of two-thirds of the albuminate of a standard diet, which is, ...	63,7007
The sum of all this is, . .	5,961,981

Or, in round numbers, 6×10^6.

On these data, then, the concinite racial diet of the Sepoy, apart altogether from the force utilised in radiating caloric from the skin, lungs, mucous and serous tracts, should contain a potential energy capable of yielding a daily kinetic equivalent of 6×10^6 foot pounds.

Taking this as a standard, my next step was to test the solvency of each caste diet, as well as the representative racial dietary, by the application of certain theories regarding the source of energy:—

I. (*Dr Lyon Playfair's.*) Excluding the question of calorific supply, will the dry albumenate in the representative diet of the Sepoy, less two ounces for life work, and $\frac{1}{12}$th for waste, enable him to perform his daily labour? Playfair assigns 3·5 ounces of dry albumenate as the correlate of active labour, and he regards one ounce of dry albumenate as the equivalent of 173 foot tons of work. Calculated on this standard each individual caste dietary is found wanting, and the representative diet is deficient by 202 foot tons, or one-third its value, being 403 against Playfair's 605·5 foot tons.

II. Will *all* the dry albumenate in the representative diet less $\frac{1}{12}$th for waste, provide energy compatible with the maintenance of life work and the ordinary labour of the Sepoy?

The result obtained by the above data is a deficit of 158·2 foot tons, or about one-fourth, being 793·3 against 951·5 foot tons. The latter is the equivalent value of *Playfair's* 2 ounces of dry albumenate for life work, and 3·5 ounces for external work.

III. Will the non-nitrogens in the representative diet implement the life proeesscs, and also provide energy sufficient for daily work ?

They do so with a balance of 864 foot tons, being 4146·8 against 3282 foot tons. We have therefore a clear storage for emergeney of one-third of the supply.

IV. When all the food (albumenate carbohydrate and hydroearbon) is regarded as a force generator, what result have we ?

Why, 1844 foot tons of a surplusage, or 5726 against 3282 foot tons.

In this and the preeeding equations 3282 foot tons is aceepted as a standard of energy. It is the mechanical equivalent of our 6×10^6 standard foot pounds, plus 25×10^5 more. The latter being regarded by Vierdôt on a calculation by Helmholtz and Dupretz as the quantitative measure of radiant, eorporeal heat.

I now proceed to summarise the spceial points about the energy of the representativc diet of the Scpoy :—

1. The dry albumenate, after deducting Playfair's factor for life work, fails to supply the energy utilised by the Sepoy in his ordinary labour.

2. Nor does the total albumenate alloeate foree sufficient to cater for automatie life work and customary toil. If, therefore, the dry albumenate is the *sole* producer of energy, either the work must fail, or the reserve allotted by Playfair for the life proeesses be run in upon and exhausted.

3. The energy of the diet in Table IV., numbers 1–2, 10–13, 28–9, which are prison diets in Burmah, Bengal, and the North-West Provinces, *do not even possess* Playfair's two ounces of dry albumenate for automatie life work, and have absolutely not a single stray granule for the purpose of generating the daily demands made by external toil ; yet this work goes on, and is by some means or other sustained, but assuredly not by the albumenate. *Ex. Nihil nihil fit.*

4. Again, only about 15 per cent. of all the eivil and jail communities have a molecule of dry albumenate for external work, after the automatie portion of Playfair, has been appor-

tioned. Yet the people flourish and maintain their muscle, but *not* on albumenate.

5. The non-nitrogens supply more energy than is wanted for internal and external labour, and have, besides, a large emergent store.

Does not this fact give confirmation to the views of Fick and Wislicensus, Vierdôt, Parkes, and Frankland, that the carbon and hydrogen of the albumenate cannot supply the heat units consumed by internal work?

6. Are the non-nitrogens then the chief source of energy? This view has been defended by the eminent observers whom I have just named. I offer a very strong confirmation of it. By Table IV. I anticipated Fick's discovery regarding the paramount action of the non-nitrogens as force producers, in so far as, by the calculations now before you, I concluded there was in many instances an insufficient quantity of Playfair's albuminate to generate work power, and that the non-nitrogens were the only other available source whence the daily demand could be supplied. Shortly after Fick's ascent of the Faülhorn I readdressed the superintendent of the Alipore or central jail in Calcutta regarding these anomalies in Indian diet. The late Dr Fawcus replied:—"The diet scales appear to be sufficient when prisoners have not much hard work to do; when they have to work very hard it was found they rapidly lost weight and became scorbutic on the jail code diet. It was thought at first that they did not get sufficient nitrogenous food, and extra curds (dahai) was given them; but this was not followed by any perceptible good effect; then four ounces of rice extra was given to the Bengalis, and five ounces of flour to the up-countrymen. Since this change 75 per cent. have improved in position and weight. Scurvy has also disappeared." Surely nitrogen is here weighed and found wanting. The carbohydrates are increasingly drawn upon after, *only after*, the total failure of the albuminates, and speedily show their power by improving condition and repairing the crippled machinery.

7. Table IV., No. 53, summarises the diet of the Panjab farm labourer, who is a hard continuous worker. It contains two

ounces more dry albuminate than any racial diet in India that I have examined. This abets Parkes' conclusion, that hard labour steadily engaged in soon proves exhausting unless the nitrogens are relatively increased.

8. A reference to Table IV., Nos. 54–5, where the dict of the Kahar coolie and cloth weaver are detailed, demonstrate that their diet assimilates to that of the Sepoy.

9. A mere casual glance at the vast array of jail diets charted in Table IV., many of which were prepared by a series of calculations similar to that on which the caste dietaries were collated, each therefore represents an average of many diets, shows that the prisoner is rationed on the minimum of food compatible with health and productive labour. Every jail dietary in use in the State jails of India up to 1869 is analysed on Table IV., and its equivalent energy recorded. I am glad to be able to lay this data before you, as attacks are ever and again being made against the Government of India and governors of our Indian jails for pampering the prisoners by the exhibition of an excessive dietary. I am not aware that the jail diets of India have ever previously been collectively examined; the result ought to silence the most captious.

10. Permit me in conclusion to say, it is apparent enough that excessive and continuous hard labour cannot be undertaken and health at the same time maintained, unless by an increased proportion of albumenates; further, that a supplementary allocation of albumenates will not restore health if lost by an inconcinite diet, nor enable one to complete "the daily round, the common task;" but when the non-nitrogens are introduced, work is efficiently done without loss of weight, and normal health is soon attained. This is assuredly a very definite result—one, too, which must heavily handicap the conclusion that azotized and non-azotized foods are cognate force purveyors, which constitute an Unlimited Liability Company by which the conservation of all the energies of life are admirably assured.

While we have been chopping away at the alphabet of dietetic philosophy, the Indian athlete has shot far ahead of us; for ages he has trained on NITROGEN to conserve energy

during excessive toil; but the tradition of caste, the echo of experience, the promptings and teachings of nature which so often shatters our cherished theories, has led him to enter the arena on CARBON, because he can get *more* energy out of his flour, ghi, and sweets, than from his flesh and lentils.

TABLE I.—*Quantitative Analyses of several Dietetic Articles generally used in British India, in decimal parts of an ounce Avoirdupois. The grains of Carbon and Nitrogen per ounce is also detailed.*

Names.	Water.	Albuminate.	Hydrocarbon.	Carbhydrate.	Salts of Metals.	Carbon.	Nitrogen.
Wheaten flour, ...	·1400	·1460	·0120	·6860	·0160	171·38	10·04
Barley flour, ...	·1550	·1129	·0220	·6910	·0191	168·70	7·79
Iowar (large millet),	·1195	·0864	·0390	·7381	·0170	176·94	5·96
Bajra (small millet),	·1180	·1013	·0462	·7085	·0260	177·16	6·98
Rice, ...	·1000	·0550	·0080	·8320	·0050	179·24	6·83
Maize, ...	·1350	·0990	·0670	·6850	·0140	177·15	3·79
Urd dal (pulse), ...	·1244	·2473	·0136	·5830	·0317	113·21	17·06
Flesh (goats), ...	·7500	·1500	·0840	...	·0160	63·98	10·35
Milk, ...	·9010	·0300	·0250	·0390	·0050	23·20	2·07
Dulhee (curds).....	·9160	·0291	·0109	·0390	·0050	18·12	2·
Ghi (melted butter),	·0870	·0030	·9100	...	...	315·19	·20
Potatoes, ...	·7400	·0150	·0010	·2340	·0100	49·28	1·03
Esculent vegetables (cabbage as standard), ...	·9100	·0200	·0050	·0580	·0070	17·65	1·38
Sugar, ...	·0300	...	...	·9650	·0050	187·40	...
Goor (unrefined sugar), ...	·4000		...	·4900	·0100	95·15	...

TABLE II.— *Ordinary Weekly Diet of the Dogra.*

1.

Pulse Diet.	Wheaten Flour, 16 oz.	Dal, 2 oz.	Ghi, 1 oz.	Total, oz.	Salt, ·4 oz.	Condiment, ·3 oz.	Remarks.
Water, ...	2·2	·2	·0	2·5	...	...	
Albuminate, ...	2·3	·4	·0	2·8	...	...	
Hydrocarbon, ...	·1	·0	·9	1·1	...	...	Six times a week.
Carbohydrate, ...	10·9	1·1	...	12·1	...	...	
Salt, ...	·2	·0	...	·3	...	...	
				19·			

2.

Rice Diet.	Ghi, 1 oz.	Dulhee, 8 oz.	Rice, 16 oz.	Total oz.	Remarks.
Water, ...	·0	7·3	1·6	9·0	
Albuminate, ...	·0	·2	·8	1·1	
Hydrocarbon, ...	·9	·0	·1	1·1	Twice a week.
Carbohydrate, ...	...	·3	13·3	13·6	
Salt,.	...	·0	·0	·1	
				25·	

TABLE II.—*Ordinary Weekly Diet of the Dogra*—continued.

3.

Milk Diet.	Wheaten Flour, 12 oz.	Ghi, 1 oz.	Milk, 32 oz.	Rice, 4 oz.	Sugar, 2 oz.	Total.	Remarks.
Water, ...	1·6	·0	28·8	·4	·0	31·0	
Albuminate, ...	1·7	·0	·9	·2	...	2·9	
Hydrocarbon, ...	·1	·9	·8	·0	...	1·8	Once a week.
Carbohydrate, ...	8·2	...	1·2	3·3	1·9	14·7	
Salt, ...	·1	...	·1	·0	·0	·3	
						51·	

4.

Vegetable Diet.	Wheaten Flour, 16 oz.	Ghi, 1 oz.	Potatoes, 4 oz.	Total oz.	Salt, ·4 oz.	Condiment. ·3 oz.	Remarks.
Water, ...	2·2	·0	2·9	5·2	...	...	
Albuminate, ...	2·3	·0	·0	2·3	...	...	
Hydrocarbon, ...	·1	·9	·0	1·1	...	...	Twice a week.
Carbohydrate, ...	10·9	...	.9	11·9	...	...	
Salt, ...	·2	...	·9	·2	...	...	
				21·			

5.

Meat Diet (seldom used unless by Native Soldiers).	Wheaten Flour, 16 oz.	Ghi, 1 oz.	Meat, 8 oz.	Total oz.	Salt, ·4 oz.	Condiment, ·3 oz.	Remarks.
Water, ...	2·2	·0	6·0	8·3	...	...	
Albuminate, ...	2·3	·0	1·2	3·5	...	...	
Hydrocarbon, ...	·1	·9	·6	1·7	...	...	Once a week.
Carbohydrate,. ...	10·9	...	...	10·9	...	...	
Salt, ...	·2	...	·1	·3	...	...	
				25·			

6.

Maize Diet.	Maize Flour, 16 oz.	Ghi, 1 oz.	Unrefined Sugar, 2 oz.	Milk, 8 oz.	Vegetables, 6 oz.	Total oz.	Salt, ·4 oz.	Remarks.
Water, ...	1·9	·0	·8	7·2	5·4	15·4	...	
Albuminate.	1·3	·0	...	·2	·1	1·7	..	
Hydrocarbon, ...	·6	·9	...	·2	·0	1·7	...	Twice a
Carbohydrate, ...	11·8	...	1·1	·3	·3	13·6	..	week.
Salt, ...	·2	...	·0	·0	·0	·3	...	
						32·9		

7.

Water, ...	16·3	Average daily diet.
Albuminate, ...	4·8	
Hydrocarbon, ...	2·6	
Carbohydrate,. ...	25·2	
Salt, ...	·6	
	49·7	

TABLE III.—*Showing the difference between the Representative Diet of the Sepoy (Native Soldier) in British India and Meleschott's, Parkes', and E. Smith's European Standards in Avoirdupois Ounces.*

RACE.	Total Solids.	Total Anhydrous Solids.	Proportion of Water in Food.	Dry Albuminate.	Hydrocarbon.	Carbohydrate.	Salts of Metals.	Proportion of Dry Albuminate to Hydrocarbon.	Proportion of Dry Albuminate to Carbohydrate.	Proportion of Nitrogens to Non-Nitrogens.	Proportion of Nitrogens to Non-Nitrogens (as starch equivalent).	Diet equivalent of Nitrogen to each pound weight of Adult Male.	Diet equivalent of Carbon to each pound weight of Adult Male.	Total Nitrogen.	CARBON.			Proportion of Nitrogen to Carbon.	Condimental Salt.	Spices.
															In Albuminate.	In Non-Nitrogens.	Total.			
	oz.	oz.			oz.	oz.	oz.					gs.	grs.	grs.	grs.	grs.	grs.		oz.	oz.
Sikh, ...	50·2	34·	32·2	5·	2·6	25·7	·64	1 :·5	1· :5·1	1:5·2	1· :6·4	2·4	50·5	346·1	1168·7	5913·6	7082·4	1 : 20·4	·57	·34
Dogra, ...	49·7	33·3	32·9	4·8	2·6	25·2	·60	1 :·5	1·2:6·3	1:5·3	1·2:7·8	2·3	48·9	335·	1131·4	5716·	6847·5	1 : 20·4	·63	·47
Hindu, ...	48·4	33·8	30·1	5·5	2·7	24·9	·65	1 :·4	1·1:4·7	1:4·6	1·1:6·3	2·7	50·6	382·4	1291·5	5797·6	7089·1	1 : 18·5	·63	·47
Panjabi Mussulman,	49·6	36·3	26·8	5·3	2·6	27·7	·65	1 :·4	1· :5·5	1:5·3	1· :6·7	2·6	53·8	372·	1256·3	6286·6	7542·9	1 : 20·2	·65	·43
Pathan	55·1	33·7	25·2	5·1	2·9	25·3	·62	1 :·4	1· :5·	1:5·	1· :6·4	2·5	50·4	353·9	1195·1	5867·9	7063·	1 : 19·2	1·03	·37
Representative Diet of the Sepoy, ...	48·4	34·2	29·3	5·14	2·68	25·76	·63	1 :·4	1·3:5·3	1:5·	1·06:6·7	2·5	50·78	359·8	1208·7	5916·3	7124·9	1 : 19·7	·70	·41
Representative Diet of the European,*	?	26·86	55·	4·58	2·96	14·25	1·05	1 :·6	·3:2·3	1:3·6	1· :4·4	1·04	·23	291·	?	?	6123·	1 : 21·2	·50	?
Difference,...	?	+7·34	−25·7	+56	−28	+11·51	−·42	−0 :·2	+1·: ·3	+0:1·4	+06:2·3	+1·46	+27·78	+68·8	?	?	+1101·9	−0 : 1·5	+·20	?

* E. Smith and Parkes' standard of active work for male European of Meleschott's average; height, 5 feet 6–10 inches; weight, 140 to 160 lbs.

TABLE IV.—*Comparative Statement showing the Dynamics of Racial Diet utilised in the State Jails, together with the Representative Dietaries of the Military and Civil Population throughout the British Empire.*

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		17	18	19	20	21	22	23	24
CLASS OF DIET.	BY WHOM USED.	Hydrous.	Anhydrous.	Dry Albuminate.	Hydro-Carbons.	Carbo-Hydrates.	Salts of Metals.	Condimental Salt.	Hot Spices.	Proportion of Nitrogens to Non-Nitrogens.	Proportion of Albuminates to Total Carbons (as Starch Equivalent).	Diet Equivalent of Nitrogen for each Pound of Body Weight.	Diet Equivalent of Carbon for each Pound of Body Weight.	Total Nitrogen.	Carbon. In Nitrogens.	Carbon. As Starch Equivalent in Non-Nitrogens.	Total Carbon.	Proportion of Nitrogen to Carbon.	Dry Albuminate Residue, minus 2 ounces for subsistence, and 1 12th for waste (Playfair).	Total Albuminate Calories, minus 2 ounces for subsistence allowance, and 1 12th for waste (Playfair), reduced to foot tons.	Total Albuminate, minus 1 12th for waste, reduced to foot tons.	Total Carbo-Hydrate and Hydro-Carbon, reduced to foot tons (minus 25×10^5 foot pounds, Verdict's Radiant Heat unity).	Total Albuminate, Carbo-Hydrate, and Hydro-Carbon, minus 6 Albuminate calories (the superfluous balance is recorded in foot pounds).	REMARKS.
		ozs.*	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	grs.	grs †	grs.	grs.	grs.	grs.							
1. Hard labour (Burmese),	In Burmah State Jails.	37·0	23·8	2·1	1·0	20·4	·2	·2	·2	1:0:10·2	1:0:11·4	1·0	34·6	147·0	496·5	4331·1	4827·6	1:32·8	...	...	343·4	3035·5	$15+10^5$	Columns 1–18 gives the static value of the diets. The ounces and grains are avoirdupois.
2. Do. do.		19·0	21·5	1·9	1·0	18·4	·2	·5	·2	1:9:18·4	1:9:20·8	0·9	31·0	131·1	426·4	3922·7	4349·1	1:33·1	...	...	306·6	2749·3	$8+10^5$	
3. Do. (Hindustanis,		32·5	22·9	3·2	1·0	18·2	·3	·5	·2	1:0: 6·0	1:0: 6·9	1·6	33·3	227·1	767·9	3906·8	4674·8	1:20·5	1·0	178·7	527·2	2738·2	$13+10^5$	Columns 19–22 shows in detail the mechanical equivalent or potential units of energy, expressed as foot pounds or foot tons.
4. Do. (Nicobaris)		29·0	26·0	2·3	1·2	22·3	·2	1·0	1·0	1:1:11·1	1:1:12·5	1·1	37·6	159·5	533·6	4730·1	5268·8	1:33·0	·1	21·0	371·5	3315·2	$22+10^5$	
5. Do. do.		25·0	21·6	3·9	1·2	16·0	·4	1·0	1·0	1:3: 5·0	1:3: 6·3	1·9	31·7	269·9	911·4	3533·4	4444·3	1:16·4	1·5	277·6	316·5	2476·4	$2+10^5$	
6. Labouring (Bengalese and Asamis),	In Bengal State jails.	33·5	33·8	2·4	·2	19·8	·2	·5	·5	1:3: 9·9	1:3:11·1	1·2	34·1	169·7	573·1	4208·4	4781·6	1:28·1	·4	73·5	422·1	2727·8	$10+10^5$	Columns 19–21 are thus calculated out:—The chemical value of one avoirdupois ounce of albuminate is regarded as:—(*Playfair*)—
7. Non-labouring do.		29·4	21·4	2·2	·8	18·1	·2	·5	·5	1:1: 9·5	1:1:10·0	1·0	29·1	153·1	517·2	3561·8	4079·1	1:26·6	·0	7·	355·5	2274·6	...	
8. Labouring (Inhab. of Berar &		29·4	21·9	3·2	·8	17·4	·3	·5	·5	1:2: 6·6	1:2: 7·5	1·7	50·2	251·1	848·1	6187·1	7035·2	1:28·0	1·3	234·8	538·2	4114·4	$45+10^5$	
9. Non-labouring } N.-W. Provinces),		33·5	25·0	3·6	1·0	19·9	·4	·6	·5	1:0: 5·8	1:0: 6·5	1·5	31·7	221·5	747·9	3692·4	4440·4	1:20·0	·9	166·4	488·3	2364·8	$3+10^5$	
10. Labouring (Mughs and Chinamen),		29·4	19·3	1·5	·9	16·6	·1	·5	·5	1:7:17·6	1:7:20·2	·8	16·2	122·8	414·7	1858·8	2273·6	1:18·5	...	...	287·3	1088·6	...	
11. Non-labouring do.		33·5	20·7	3·4	2·0	·5	1·0	·5	·5	1:5:16·6	1:5:19·0	·7	28·0	194·8	354·1	3576·0	3930·1	1:37·4	...	...	233·7	2284·9	...	
12. Labouring (Coolies, Santhals,		29·4	19·3	1·5	·9	16·6	·1	·5	·5	1:0:10·4	1:0:11·0	1·0	19·3	142·1	479·9	4228·3	4708·3	1:33·1	...	...	325·9	2741·7	$8+10^5$	
13. Non-labouring } and Junglis),		33·4	23·6	2·0	·5	20·8	·2	·5	·5	1:5:16·6	1:5:19·0	·9	17·1	138·0	466·1	1940·0	2406·0	1:17·4	...	...	269·8	1137·9	...	
14. Rice (general),	In Madras State jails.	29·8	21·7	2·0	·8	23·6	·2	·9	1·5	1:3:11·8	1:3:12·9	1·3	39·5	186·3	628·1	4908·1	5536·2	1:29·7	·4	84·1	423·7	3306·9	$23+10^5$	
15. Dry grain, do.,		39·5	27·5	2·7	·8	23·6	·2	·9	1·5	1:1: 6·3	1:1: 7·8	1·6	36·7	231·1	780·5	4365·6	5146·1	1:22·2	1·0	180·2	528·8	1468·8	...	
16. Mixed grain, do.,		37·6	25·1	3·3	1·8	19·1	·7	·9	1·5	1:0: 7·1	1:0: 8·2	1·0	36·6	143·5	484·6	4643·8	5128·4	1:35·7	·8	145·4	493·9	3032·9	$19+10^5$	
17. Labouring, do.,		38·7	26·4	2·0	1·4	21·3	·5	·9	1·5	1:0: 5·1	1:0: 5·9	1·9	38·3	273·9	925·0	4447·6	5372·6	1:19·6	1·6	287·3	636·5	2895·4	$19+10^5$	
18. Chinese and Malays, do.		37·4	26·5	3·9	1·3	20·5	·7	·3	·9	1:0: 5·1	1:0: 5·9	1·9	39·5	268·4	908·5	4622·1	5530·7	1:20·6	1·5	404·8	623·6	3017·7	$21+10^5$	
19. Non-labouring, do.,		39·7	27·3	3·8	1·3	21·4	·6	·3	·9	1:3: 7·1	1:3: 8·2	1·9	39·5	268·4	908·5	4622·1	5530·7	1:20·6	1·5	404·8	623·6	3017·7	$21+10^5$	
20. Labouring, do.,	In Bombay State jails.	28·4	20·2	2·8	1·1	13·6	·5	·3	·9	1:4: 7·7	1:4: 9·1	1·4	26·5	199·4	673·3	3044·3	3717·7	1:18·6	·6	117·3	465·9	1912·3	...	
21. Do. do.,		35·6	28·7	4·6	1·5	21·8	·6	·2	·0	1:1: 5·3	1:1: 6·4	2·2	41·9	319·4	1078·7	4793·2	5871·9	1:18·4	2·2	394·2	742·9	3137·6	$26+10^5$	
22. Non-labouring, do.,		32·7	26·8	3·2	·7	22·4	·3	·2	·0	1:0: 7·4	1:0: 8·1	1·6	38·5	224·9	759·5	4631·3	5390·8	1:23·9	·9	242·3	487·4	3024·1	$18+10^5$	
23. Labouring, do.,	In the State Jails of Central Provinces.	26·4	20·7	3·4	·8	15·9	·5	·2	·0	1:1: 5·3	1:1: 6·0	1·6	30·0	237·3	801·5	3399·2	4200·7	1:17·6	1·1	25·8	551·7	2160·6	$7+10^5$	
24. Do. do.,		26·4	21·2	2·5	·3	18·0	·2	·2	·0	1:2: 9·0	1:2: 9·4	1·2	30·1	177·3	598·9	3625·8	4224·6	1:23·8	·3	63·0	411·5	2319·4	$1+10^5$	
25. Do. do.,		33·4	26·8	4·1	1·2	20·8	·6	·2	·0	1:0: 5·2	1:0: 5·9	2·0	38·8	287·0	969·2	4465·7	5435·0	1:18·9	1·8	336·7	667·4	2908·1	$20+10^5$	
26. Labouring do.		30·5	25·1	2·8	·4	21·4	·2	·2	·0	1:0: 5·1	1:0: 5·8	1·9	38·2	276·6	934·3	4415·2	5349·6	1:19·6	1·6	294·3	642·8	3094·7	$23+10^5$	
27. Non-labouring do.		32·9	26·3	4·0	1·2	20·4	·6	·2	·0	1:2: 6·5	1:2: 7·5	1·2	24·3	169·7	573·1	2841·6	3414·8	1:20·1	·2	43·4	391·9	1769·8	...	
28. Labouring do.	In State Jails of North West Provinces	22·4	16·8	2·4	·8	13·1	·4	·2	·0	1:9:18·8	1:9:21·1	·9	31·6	138·1	429·6	3998·2	4427·9	1:33·2	...	...	308·4	2580·4	$4+10^5$	
29. Non-labouring do.		26·5	21·9	1·9	·9	18·8	·1	·1	·6	1:7:15·4	1:7:17·6	·8	26·5	117·3	396·1	3322·2	3718·3	1:31·7	...	...	272·5	2106·6	...	
30. Labouring do.		22·4	18·2	1·7	·9	15·4	·1	·1	·6	1:7:15·4	1:7:17·6	·8	26·5	117·3	396·1	3322·2	3718·3	1:31·7	...	...	272·5	2106·6	...	
31. Non-labouring do.		29·6	24·1	4·6	·6	18·3	·5	·2	·0	1:1: 4·7	1:1: 4·9	2·2	34·8	320·8	1083·4	3788·8	4872·3	1:15·1	2·2	377·1	725·6	2432·8	$10+10^5$	
32. Labouring do.	In State Jails of Oude.	22·0	17·2	3·2	·5	13·1	·3	·2	·0	1:0: 4·3	1:0: 4·7	1·5	24·7	221·4	747·9	2720·2	3468·2	1:15·6	·9	166·4	488·3	1684·7	...	
33. Non-labouring do.		34·9	25·6	5·3	·9	18·7	·5	·5	·5	1:0: 3·7	1:0: 4·1	2·6	37·2	370·5	1251·2	3958·3	5202·5	1:14·0	2·9	513·4	861·9	2552·5	$16+10^5$	
34. Non-labouring (with meat),	In the State Jails of the Punjab.	34·0	24·9	4·9	·6	18·8	·5	·5	·5	1:2: 4·7	1:2: 5·1	2·4	36·6	338·7	1144·0	3886·3	5030·4	1:14·8	2·5	439·8	788·3	2501·8	$13+10^5$	
35. Do. (with curds),		25·2	17·3	5·4	·6	12·8	·3	·5	·5	1:1: 4·2	1:1: 4·8	1·7	25·2	240·1	810·8	2723·1	3533·9	1:14·7	1·1	207·7	511·7	1686·7	...	
36. Non-labouring (with meat),		24·3	16·8	3·7	·4	12·9	·3	·5	·5	1:0: 4·3	1:0: 4·6	·7	12·3	104·8	354·1	1380·0	1734·2	1:16·5	·8	152·4	500·9	745·4	...	
37. Do. (with curds),		22·7	16·8	3·0	·6	6·2	·3	·1	·5	1:0: 4·2	1:0: 4·7	·7	11·8	103·5	349·5	1313·5	1663·0	1:16·0	·8	145·4	493·9	698·8	...	
38. Under trial, do.,		27·7	19·1	3·3	1·2	14·0	·4	·5	·5	1:1: 4·6	1:1: 5·6	1·6	28·0	229·7	775·8	3147·1	3923·0	1:15·7	1·0	160·6	539·1	1983·7	...	
39. Non-labouring do.		33·4	18·9	3·0	·9	14·4	·4	·5	·5	1:0: 4·8	1:0: 5·5	1·5	27·5	212·5	717·6	3137·5	3855·1	1:18·1	·8	145·4	493·7	1977·2	...	
40. Labouring (with curds),		23·7	16·2	2·8	1·0	11·9	·4	·5	·5	1:4: 5·9	1:4: 7·2	1·4	23·9	188·7	671·0	2675·1	3346·1	1:16·8	·6	112·1	466·0	1652·2	...	
41. Non-labouring do.		24·8	15·9	2·5	·8	12·0	·3	·5	·5	1:2: 1·0	1:2: 7·0	1·2	10·7	178·7	603·4	2684·9	1490·3	1: 8·3	·3	66·5	415·0	1660·0	...	
42. Labouring (wheat),	Diet scale recommended for prisoners by Calcutta Medical Board in September 1843.	40·0	38·0	6·0	1·3	22·7	·6	1·0	·5	1:0: 3·7	1:0: 4·0	2·9	45·0	414·6	1400·3	4900·8	6301·1	1:15·1	3·5	610·4	963·5	3213·0	$33+10^5$	
43. Non-labouring (rice),		40·0	31·9	3·5	1·2	20·7	·3	1·0	1·0	1:1: 8·9	1:1: 9·4	1·7	46·1	244·9	827·1	5629·8	6457·0	1:26·3	1·2	220·7	569·2	3724·0	$36+10^5$	
44. Labouring (wheat),		31·3	25·5	4·9	·8	19·1	·5	1·0	1·0	1:2: 4·7	1:2: 5·0	2·4	36·8	342·2	1155·6	4007·7	5163·4	1:15·3	2·5	446·8	795·3	2587·1	$15+10^5$	
45. Labouring, do.,		31·3	26·4	2·9	·5	22·4	·3	1·0	1·0	1:4:11·2	1:4:11·6	1·4	37·8	200·1	675·7	4619·4	5295·1	1:26·4	·6	115·6	460·9	3015·8	$17+10^5$	
46. Non-labouring (rice),		33·5	27·6	5·0	·9	21·5	·5	1·0	1·0	1:0: 5·3	1:0: 5·9	2·4	40·5	346·3	1169·6	4504·4	5674·1	1:16·3	2·6	457·3	805·8	2935·2	$23+10^5$	
47. Labouring, do.,	Do. by Dr Beattie.	25·2	20·9	3·3	·8	15·8	·4	1·0	1·0	1:2: 5·1	1:2: 5·9	1·8	30·4	263·5	890·0	3572·6	4262·7	1:16·1	1·5	246·7	612·6	2142·0	$1+10^5$	
48. Non-labouring, do.,		54·5	25·7	6·0	1·7	17·1	·8	1·0	1·0	1:0: 2·8	1:0: 3·5	2·9	59·5	414·6	1400·3	3933·9	8336·3	1:20·1	3·5	670·4	963·5	1649·6	...	
49. Labouring, do.,		36·5	19·0	4·2	1·3	12·7	·5	1·0	1·0	1:0: 3·1	1:0: 4·0	2·0	28·2	288·5	987·9	2964·2	3952·1	1:13·6	1·8	333·8	679·6	1855·8	...	
50. Non-labouring, do.,	Do. by Dr Ewart.	36·0	24·4	5·6	1·9	17·2	·6	1·0	1·0	1:1: 3·4	1:1: 4·3	2·7	37·9	388·4	1311·7	4006·5	5318·3	1:13·6	3·1	555·4	903·9	2586·3	$18+10^5$	
51. Labouring (for Panjabis),		26·0	18·0	3·7	1·6	12·1	·4	1·0	1·0	1:2: 4·0	1:2: 5·3	1·8	27·1	259·4	876·0	2928·6	3804·7	1:14·6	1·4	373·8	602·1	1830·8	...	
52. Non-labouring do.		41·0	26·1	3·8	1·7	19·8	·7	1·0	1·0	1:2: 6·6	1:2: 8·0	1·8	39·6	262·8	887·7	4463·7	5351·5	1:20·3	1·5	262·8	611·3	2906·7	$18+10^5$	
53. For prisoners generally,	Do. by Dr Cornish.	26·8	31·5	3·7	1·4	25·5	·7	4·1	...	1:2: 8·1	1:2: 9·6	1·8	45·3	260·8	880·7	5463·3	6344·0	1:24·3	1·4	255·7	606·0	3607·3	$24+10^5$	
54. Scinde diet,	Used by labourers in Scinde.	147·0	42·8	7·5	2·9	31·1	1·2	·4	·4	1:0: 4·4	1:0: 5·4	3·7	62·8	519·5	1754·4	7049·6	8804·1	1:16·9	4·9	860·3	1208·8	3350·0	$42+10^5$	
55. Farm servants,	Used by Panjabis generally.	39·3	31·6	4·3	1·4	25·1	·6	·4	·4	1:0: 4·2	1:0: 7·1	2·1	45·5	298·0	1006·5	5376·3	6382·9	1:21·4	1·9	343·4	691·9	3546·3	$34+10^5$	
54. Coolies and Kahars,		31·6	25·0	3·5	1·6	19·2	·5	·2	·4	1:1: 6·4	1:1: 7·7	1·7	36·7	247·7	836·4	4314·4	5150·8	1:20·7	1·3	227·7	576·3	2802·8	$15+10^5$	
55. Weavers,		35·5	19·9	3·2	1·5	14·6	·3	·2	·5	1:0: 4·8	1:0: 6·1	1·6	29·6	227·0	766·5	3388·7	4153·3	1:18·3	1·0	178·7	527·2	2153·3	$4+10^5$	
56. Better classes,	Native military soldiers in Northern India.	48·4	33·8	5·5	2·7	24·9	·6	·6	·4	1:1: 4·9	1:1: 6·3	2·7	50·6	382·4	1291·5	5797·6	7089·1	1:18·5	3·0	537·6	890·1	4063·4	$50+10^5$	
57. Hindustani Hindus,		49·7	33·3	4·3	2·6	25·2	·6	·6	·4	1:2: 6·3	1:2: 7·3	2·3	48·9	335·0	1131·4	5716·0	6847·5	1:20·4	2·4	429·2	779·7	4006·2	$47+10^5$	
58. Dogra or Hill do.,		50·2	34·0	5·0	2·6	25·7	·6	·5	·3	1:0: 5·1	1:0: 6·4	2·4	50·5	346·1	1168·7	5913·6	7082·4	1:20·4	2·6	455·8	806·0	4146·1	$50+10^5$	
59. Sikh do.,		49·6	36·3	5·3	2·6	27·7	·6	·6	·4	1:0: 5·5	1:0: 6·7	2·6	53·8	372·0	1256·3	6286·6	7542·9	1:20·2	2·9	516·8	867·3	4406·1	$58+10^5$	
60. Hindustan and Panjabi Mussulman,		45·1	33·7	5·1	2·9	25·0	·6	1·0	·3	1:0: 5·0	1:0: 6·4	2·5	50·4	353·9	1195·0	5867·9	7063·0	1:19·9	2·7	473·0	823·5	4112·7	$50+10^5$	
81. Patban,		43·	33·2	4·1	6·0	22·5	·5	2·	3·	1:0: 5·6	1:0: 9·2	2·0	53·1	285·3	903·4	6471·3	7434·8	1:26·0	1·7	313·6	662·9	4584·8	$56+10^5$	
62.		32·	25·2	2·8	4·1	17·8	·4	2·	2·	1:4: 8·9	1:4:13·9	1·4	39·7	196·5	652·5	4910·6	5563·2	1:28·3	·6	106·8	456·2	3442·0	$27+10^5$	
63.		37·	27·9	3·4	5·0	18·9	·2	1·	2·	1:1: 6·3	1:1:10·3	1·7	44·8	238·3	804·7	5439·7	6280·5	1:26·3	1·1	205·0	554·3	3812·5	$37+10^5$	
64.		31·	24·7	3·7	3·9	16·7	·3	2·	3.	1:2: 5·5	1:2: 8·7	1·8	39·1	257·5	869·5	4606·5	5476·1	1:21·2	1·4	248·8	598·1	3228·6	$25+10^5$	
65.		30·	19·3	2·9	4·2	11·9	·3	1·	·	1:4: 5·9	1:4:11·0	1·4	31·8	200·7	678·0	3776·9	4454·9	1:22·1	·6	135·1	484·4	2638·3	$9+10^5$	
66.		30·	19·3	2·9	2·6	13·4	·4	2·	·	1:4: 8·7	1:4: 9·8	1·4	30·0	201·9	681·9	3519·7	4201·7	1:20·8	·6	119·1	468·4	2466·8	$5+10^5$	
67.		28·	19·6	2·7	1·6	14·7	·4	2·	2·	1:3: 7·3	1:3: 9·3	1·3	19·6	190·9	644·7	2105·7	2750·4	1:14·4	·5	92·8	442·2	1476·7	...	
68.		32·	20·5	3·8	3·5	12·5	·5	2·	2·	1:2: 4·1	1:2: 7·0	1·9	32·7	268·0	905·2	3680·5	4585·7	1:17·1	1·5	273·3	622·6	2574·6	$11+10^5$	
69.		35·	21·7	3·4	2·8	14·9	·4	2·	3·	1:4: 4·9	1:4: 9·2	1·7	33·6	238·6	805·9	3905·8	4711·7	1:19·7	1·1	265·0	554·3	2737·3	$13+10^5$	
70.		36·	21·1	3·6	2·8	14·1	·4	2·	2·	1:2: 4·7	1:2: 7·0	1·8	33·1	252·7	853·4	3782·6	4636·1	1:18·3	1·3	238·2	587·6	2651·1	$12+10^5$	
71.	Generally used in South-Western India.	37·	20·7	3·8	3·7	12·6	·4	2·	2·	1:2: 4·2	1:2: 7·2	1·8	33·3	265·8	897·7	3772·4	4670·2	1:17·5	1·5	268·1	617·4	2644·3	$13+10^5$	
72.		54·5	33·7	4·3	3·2	25·4	·6	·5	·5	1:0: 6·3	1:0: 8·3	2·1	50·5	297·6	1005·1	6077·5	7082·6	1:23·7	1·9	343·4	692·7	4255·1	$50+10^5$	
73.		35·5	24·9	3·3	·3	20·9	·3	·5	·5	1:1: 6·9	1:1: 7·2	1·6	35·4	231·6	781·9	4175·9	4957·8	1:21·4	1·0	189·2	538·5	2926·8	$17+10^5$	
74.		43·	32·1	4·1	1·9	25·4	·5	1·	·5	1:0: 6·3	1:0: 7·5	2·0	47·1	287·1	969·5	5625·9	6595·4	1:22·9	1·8	318·0	667·3	3943·1	$43+10^5$	
75.		42·5	34·1	4·5	1·7	27·2	·7	1·5	1·5	1:1: 6·8	1:1: 7·8	2·2	50·1	310·8	1049·6	5977·7	7027·4	1:22·5	2·1	373·2	722·5	4189·6	$50+10^5$	
76		33·	28·6	4·8	1·2	22·0	·5	...	...	1:2: 5·5	1:2: 6·2	2·3	41·7	333·3	1125·6	4723·6	5848·6	1:14·5	2·4	425·7	775·1	3310·2	$31+10^5$	
77.		45·	26·8	4·2	1·4	20·6	·4	·5	1·5	1:0: 5·1	1:0: 6·0	2·1	27·2	295·5	997·9	2816·0	3814·0	1:12·9	1·9	338·1	687·5	1973·7	...	
78.		58·	36·2	6·6	2·7	25·7	1·0	...	1·	1:1: 4·2	1:1: 5·4	3·2	52·1	457·2	1544·0	5962·6	7506·6	1:16·4	4·0	713·1	1062·4	4179·0	$57+10^5$	
79.		45·	26·8	4·2	1·4	20·6	·4	·5	1·5	1:0: 5·1	1:0: 6·0	2·1	39·3	295·5	997·9	4505·1	5503·0	1:18·6	1·9	338·1	687·5	3157·5	$26+10^5$	
80.		36·	28·4	4·3	1·0	22·4	·5	·4	1·	1:0: 5·6	1:0: 6·2	2·1	41·0	300·9	1016·1	4724·2	5740·3	1:19·0	2·0	349·3	698·7	3311·1	$29+10^5$	
81.		24·	21·0	3·2	·7	16·6	·4	...	·5	1:0: 5·5	1:0: 6·1	1·5	30·3	221·5	748·1	3503·1	4251·2	1:19·1	·9	236·5	685·8	2455·2	$8+10^5$	
82.		26·	19·7	2·5	·8	15·9	·4	131·2	·5	1:2: 7·9	1:2: 8·9	1·2	24·0	175·8	493·9	3372·0	3866·0	1:21·9	·3	57·8	407·1	2363·4	$2+10^5$	
83.		36·	25·3	3·3	1·0	20·4	·5	131·3	1·	1:1: 6·8	1:1: 7·6	1·6	36·4	230·2	785·2	4321·8	5107·0	1:22·1	1·0	185·7	535·0	3029·0	$19+10^5$	
84.		36·1	24·8	3·6	1·4	19·1	·3	·6	1·2	1:2: 6·3	1:2: 8·1	1·7	36·6	250·4	845·5	4195·5	5041·0	1:20·1	1·3	231·2	580·8	2940·5	$18+10^5$	
85.		38·4	25·1	3·2	1·2	20·1	·5	·8	1·	1:0: 6·7	1:0: 7·6	1·6	33·8	224·5	726·3	3949·7	4675·1	1:20·8	·9	171·7	520·0	2768·2	$13+10^5$	
86.		29·1	20·7	3·3	1·1	15·7	·5	·8	1·2	1:1: 5·2	1:1: 6·1	1·6	30·1	230·1	777·0	3450·7	4227·8	1:18·1	1·0	185·7	535·0	2418·5	$6+10^5$	
87.		28·8	18·7	2·8	·8	14·7	·5	...	...	1:4: 7·3	1:4: 8·1	1·3	26·7	195·6	660·7	3090·0	3750·8	1:19·3	·6	105·1	454·4	2168·5	...	
88.																								

* Avoirdupois Ounces.

† Avoirdupois Grains.

Columns 19–22 shows in detail the mechanical equivalent or potential units of energy, expressed as foot pounds or foot tons.

Columns 19–21 are thus calculated out:—The chemical value of one avoirdupois ounce of albuminate is regarded as:—(*Playfair*)—

Carbon,	235·37 grains.
Hydrogen,	30·62 ,,
Sulphur,	5·25 ,,

These are reduced to calories by multiplying them by C. G. S. Andrew's factors, or heat equivalent units:—

Carbon,	7900
Hydrogen,	3380·8
Sulphur,	2307.

Each of these calories are again serially developed into (*Playfair*) kilogrammes by dividing by 15482. The kilos are raised to metre kilogrammes by multiplying them by 425. The metre kilos are converted into English foot pounds by multiplying by 7·216. The foot pounds are elevated into foot tons by dividing by 2240. The carbo-hydrate and hydro-carbon are calculated out on the value per ounce of each, as detailed in "Parke's Hygiene".

Column 22 gives the balance of energy, after deducting Vierdot's radiant corporeal heat units.

Column 23 determines the residue of potential energy after automatic and hard labour requirements are fully met.